water partings of the larger river systems, and the printing of the daily precipitation for some 5000 stations was undertaken. Inasmuch as charge of the rainfall stations was vested in the climatological division, the chief editorship was given to the late Prof. Frank H. Bigelow, who was assisted by 12 editors, drawn from the field service, one for each district. On Professor Bigelow's resignation from the Federal Weather Service in 1910, his successor in charge of the climatological division, P. C. Day, assumed the editorship.

The new form of the REVIEW was abandoned in December 1913, and the publication with some minor modifications reverted to the form which it has held from 1893 to 1909. Professor Abbe resumed his former position as editor and continued as such until he was forced by ill health to surrender it to his son Cleveland Abbe, jr., in July, 1915.

The tabulation below presents in convenient form the succession of editors up to the present.

Periods	Names
October to December, 1872	Thompson B. Maury.
January, 1873, to July, 1891	C. Abbe and others.
July, 1891, to July, 1893	Editorial board consisting of H. E. Smith and Profs. Russell, Hazen, and Marvin with E. B. Garriott as actual editor.
August, 1893, to July, 1909	C. Abbe.
July, 1909, to July, 1910	F. H. Bigelow and 12 district editors.
August, 1910, to December, 1913.	P. C. Day and others.
January, 1914, to June, 1915	C. Abbe.
July, 1915, to June, 1918	C. Abbe, jr.
July, 1918, to May, 1919	H. H. Kimball, acting.
June, 1919, to April, 1921	Charles F. Brooks.
May, 1921	Alfred J. Henry.

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NOTES, ABSTRACTS, AND REVIEWS

The Stratosphere over North India.—Ascents of sounding balloons carrying Dines meteorographs carried out from the Upper Air Observatory, Agra, during the last two and a half years have yielded interesting information regarding the height and temperature of the base of the stratosphere over northern India and their remarkable seasonal variations. A brief summary of the results may be of interest.

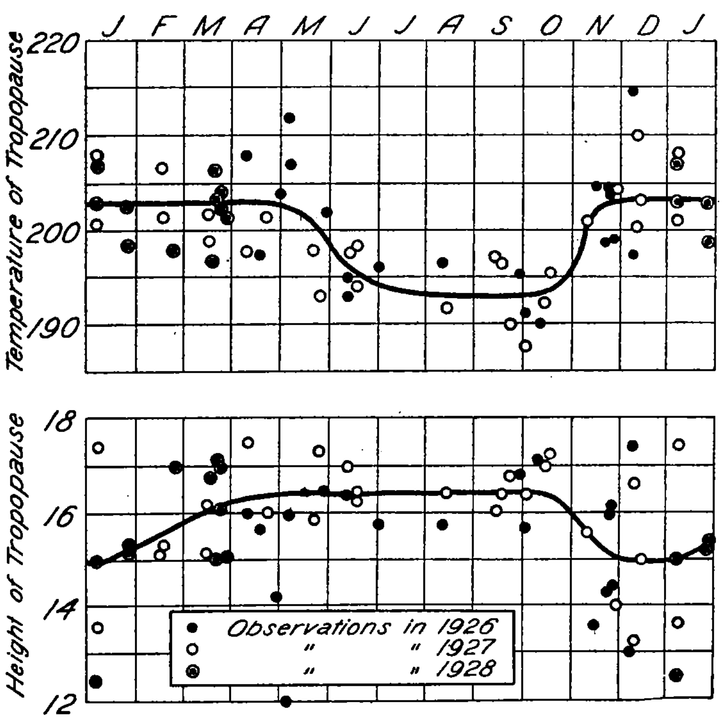

FIGURE 1

All the three types of transition from the troposphere to stratosphere classified by W. H. Dines, namely, Type I. When the stratosphere commences with an inversion; Type II. When the stratosphere begins with an abrupt transition to a temperature gradient below 2° C. per kilometer without inversion; and Type III when the decrease of lapse-rate takes place gradually; are met with. In addition, a fourth composite type with I above II or III is common between the months November to April.

During the period April, 1926, to March, 1928, 46 records of ascents to the stratosphere are available. The mean height of the tropopause (H_c) is 15.9 geodynamic or 16.3 ordinary kilometers and the mean temperature (T_c) 199° A.

In Figure 1 are plotted the heights and temperatures of the tropopause obtained from the records of these ascents. When the transition is of the composite type, both positions of rapid changes of lapse rate are plotted. The sudden jump of temperature and height of tropopause between October and November is specially noteworthy, as it occurs more than a month and a half later than the time of withdrawal of the monsoon from north India. From the point of view of seasonal variation, we may divide the year broadly into two parts—

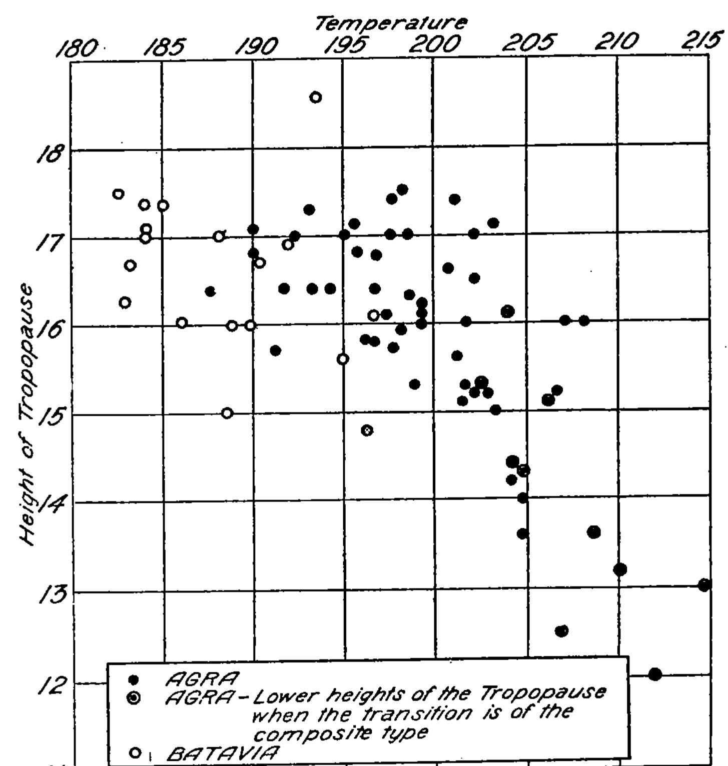

FIGURE 2

(1) *Middle of May to end of October.*—During this period, the type of tropopause is either I or II; if II, the initial sudden change of lapse rate is followed by an inversion soon after, so that there is always an inver-

sion of temperature in the stratosphere. The mean value of the height of the tropopause is 16.5 geodynamic kilometers, and its mean temperature 194.5° A. The period of activity of the monsoon in northern India is July to September.

(2) *November to middle of May.*—In this period, Types III and IV are more frequent. Even here there is almost always an inversion of temperature above 17 geodynamic kilometers. The mean values of H_c and T_c during this period are 16.2 gkm. and 201° A. if we take the values corresponding to the higher value of H_c on occasions when the transitions were of type IV, and 14.9 gkm. and 203.5° A. if we take values corresponding to the lower values of H_c.

A significant feature shown by the results of the monsoon period is the comparatively high temperature between 4 and 13 gkm. and the close agreement of the height-temperature lines between these limits with those of saturation adiabatics.

In Figure 2 are shown the values of T_c plotted against the corresponding values of H_c. The values obtained by Van Bemmelen from ascents at Batavia are also plotted for comparison. The general tendency of H_c to approach a limiting value of about 17.5 gkm. with decreasing T_c is very suggestive.—*K. R. Ramanathan, Meteorological Office Poona, October 12.*

Cours de Physique, Troisième Partie, Aérologie et Aérodynamique. By E. Rothé (Gauthier-Villars, Paris, 1928).—This book is an elementary treatment of the sciences of aerology and aerodynamics based largely on the lectures of Professor Rothé at the Aerodynamic Institute of the Faculty of Sciences at Nancy and at the Geophysical Institute at Strasbourg. The publication of the part on aerodynamics was interrupted by the war in 1914 and although the original manuscript was revised, the revision appears to have consisted mainly of the addition of the Strasbourg lectures on aerology. There are exceedingly few references to work in aerodynamics carried out after 1914. Unfortunately, aerodynamics has advanced so rapidly that experiments made prior to 1910 are obsolete, because models were too large, the interference of supports was excessive, the airstreams were nonuniform and turbulent, and instruments and experimental technique were, according to present day standards, primitive. The book of Professor Rothé represents in general the state of the science in 1914 rather than in 1928. Dimensional coefficients are used instead of the nondimensional coefficients which have been in use almost universally for several years. The value given as the result of the most precise "modern" experiments on the resistance of flat plates is about 20 per cent too high. The only aerodynamic balance described is the obsolete Eiffel balance. Such examples could be multiplied.

An entire chapter is devoted to the so-called paradox of Dubuat. In 1786 Dubuat published an account of experiments on plates towed in still water and immersed in running water, in which a difference of about 30 per cent was found, depending on whether the plate or the water was moving. Notwithstanding the fact that both results are considerably in error because of the use of an inaccurate anemometer for the measurement of the speed of the flowing water, because of the interference of large supports, and of an inaccurate method of obtaining the total force from pressure measurements, this "paradox" and its many "explanations" are often quoted by engineers as showing that the forces on bodies in fluids depend on whether body or fluid is moving. Professor Rothé quotes an "explanation" given by Joukowski in 1916 that the difference was due to turbulence in the flowing water, and describes confirming experiments in which plates are moved in a tube just a little larger than the plate. According to the best of our knowledge, the flow around a thin flat plate in a large stream is not very sensitive to the amount of turbulence present, and turbulence has no place in an "explanation" of the Dubuat "paradox." The effects of turbulence are felt only in bodies of curved outlines such as spheres, cylinders, ellipsoids, airship hulls, etc.

Notwithstanding the fact that Professor Rothé's book is not suitable for beginning the study of aerodynamics, the advanced student will find a number of the older experiments brought together in a convenient place and will find much of historical interest in the book.—*H. L. Dryden, Physicist.*

The diurnal variability of humidity in northwestern Washington (by George W. Alexander).—Author's Abstract: An attempt was made to discover whether or not there is any consistent relationship between relative or absolute humidity, as indicated at the morning (5 a.m. Pacific time) observation and the percentage of relative humidity (degree of fire hazard) during the afternoon of the same day. The results were altogether negative.

Over a total of 8,268 dates it was found that low relative humidity in the afternoon was preceeded by normal relative humidity in the morning in 67 per cent of the cases and by near normal conditions in an additional 21 per cent. Greatly subnormal relative humidity at morning observation was of rare occurrence, and usually marked the culmination rather than the beginning of a period of "fire weather." Even the lowest percentages in the afternoon frequently followed abnormally high morning percentages.

The absolute humidity, as represented by the temperature of the dew point, was normal or near normal on 88 per cent of days with subnormal relative humidity in the afternoon. There is a tendency for variation in the absolute humidity, the dew-point temperature and the relative humidity each decreasing in 38 per cent of these days. In April, May, and September east winds cause abnormally low absolute and relative humidities simultaneously three or four times each year; in midsummer most cases of low relative humidity are due to increases in temperature.

The conclusion is expressed that, for this section at least, morning humidities can not be used effectively as arguments in the development of empiric formulæ for determining the percentage of relative humidity during the following afternoon, and that the determination of the nature and extent of changes in humidity must be based on a proper interpretation of the weather map.

Arctic exploration.—Sir Hubert Wilkins, speaking before the British Empire Chamber of Commerce, in the Whitehall Club in New York on March 20, 1929, outlined a 10-year plan to establish 12 weather-observing stations in the Antarctic and sub-Antarctic for the betterment of weather forecasting. Sir Hubert, it may be remembered, made an airplane flight from Point Barrow, Alaska, to Spitzbergen in April, 1928.

According to the report of the luncheon as printed in the New York Times of March 21, 1929, Sir Hubert is reported as saying:

The plan that has been before the Meteorological Society now for a number of years is this: We shall lay down in the Arctic some